

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): IOWA DOT

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # TPF-5(219)		Transportation Pooled Fund Program - Report Period: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31, 2016) <input type="checkbox"/> Quarter 2 (April 1 – June 30, 2016) <input type="checkbox"/> Quarter 3 (July 1 – September 30, 2016) <input type="checkbox"/> Quarter 4 (October 1 – December 31, 2016)	
Project Title: Development of a Structural Health Monitoring System to Evaluate Structural Capacity and Estimate Remaining Service Life for Bridges			
Project Manager: Ahmad Abu-Hawash		Phone: 515-239-1393	E-mail: ahmad.abu-hawash@dot.iowa.gov
Project Investigator: Brent Phares		Phone: 515-294-5879	E-mail: bphares@iastate.edu
Lead Agency Project ID: RT 329	Other Project ID (i.e., contract #): Addendum 367	Project Start Date: 3/01/10	
Original Project End Date: 2/28/15	Current Project End Date: 6/30/17	Number of Extensions:	

Project schedule status:

On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Total Percentage of Work Completed
\$869,911.00	\$517,449.86	64%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$14,695.78		2%

Project Description:

- Literature Review: Damage detection and load rating algorithms
- Literature Review: Techniques for assessing remaining service life
- Interim Report
- Development of real-time, strain-based algorithm(s)
- Development of real-time, vibration-based algorithm(s)
- Development of real-time, fused-data algorithm(s)
- Compare and contrast result(s) from Tasks 4 through 6
- Interim Report
- Development of Statistical Models to Extrapolate Time-dependent Load Ratings
- Development of Structural Models to Quantify Extrapolations
- Final Report

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

As was discussed in great detail, we have made very good progress in the development of a full suite of software programs that execute the various algorithms for damage detection and load rating. These have been deployed on two bridges with 100% uptime not related to power outages.

Our work related to remaining life estimation. We have explored two possible approaches thus far and are now working on a third. In the first approach, we tried to leverage historic NBI data to develop a predictive model. The difficulty with this is how to integrate the structural monitoring data that was the target of this project. Second, we attempted to utilize measurements from the bridge deck itself to detect changes (cracking, delaminations, etc.). Although this seems technically possible, the cost to deploy may be prohibitive. We are now looking into an approach that strives to forecast data into the future and to then use our current algorithms.

Anticipated work next quarter:

In addition, we will continue working on our remaining life models. This will include doing some preliminary testing of several bridges to explore potentially viable instrumentation schemes.

Additional work in the next quarter will include the installation of the SHM system on a bridge in Wisconsin.

Significant Results:

Circumstance affecting project or budget (Describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope, and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

None.